

What is claimed is:

1. A system for controlling evaporative emissions of a volatile fuel, the system comprising:

a fuel tank including a refueling tube, the fuel tank defining a liquid fuel space and a fuel vapor headspace above the liquid fuel space;

a fuel tank isolation valve including:

a housing defining a chamber and an interior aperture, the housing including first and second ports in fluid communication with the chamber, the first port being in fuel vapor communication with the fuel vapor headspace of the fuel tank, and a fuel vapor flow path between the first and second ports passing through the interior aperture;

a diaphragm movable with respect to the housing between a first configuration and a second configuration, the diaphragm in the first configuration:

- i) occludes the interior aperture,
- ii) divides the chamber into first, second and third sub-chambers, and
- iii) substantially prevents fuel vapor flow along the fuel vapor flow path,

and the diaphragm in the second configuration:

- i) divides the chamber into the first sub-chamber and a combination of the second and two sub-chambers, and
- ii) permits generally unrestricted fuel vapor flow along the fuel vapor flow path; and

a coil spring being disposed in the first sub-chamber and biasing the diaphragm toward the first configuration;

a passage providing fluid communication between the refueling tube and the first sub-chamber; and

a fuel vapor collection canister being in fuel vapor communication with the second port of the fuel tank isolation valve.

2. The system according to claim 1, wherein the liquid fuel space is proximate a bottom of the fuel tank and the fuel vapor headspace is proximate a top of the fuel tank.
3. The system according to claim 2, wherein the refueling tube comprises an inlet and an outlet, the inlet is disposed above the fuel tank and the outlet is disposed proximate the bottom of the fuel tank.
4. The system according to claim 3, wherein the refueling tube comprises a tap in fluid communication with the passage, the tap being positioned above the fuel tank.
5. The system according to claim 4, wherein the tap is within eight inches of the inlet of the refueling tube.
6. The system according to claim 3, further comprising:
a cap occluding the inlet of the refueling tube.
7. The system according to claim 6, wherein the cap comprises an orifice permitting air to flow into the refueling tube when the cap occludes the inlet of the refueling tube.
8. A system for controlling evaporative emissions of a volatile fuel, the system comprising:
a fuel tank including a refueling tube; and
a fuel tank isolation valve including:
a housing including first and second ports, the first port being in fuel vapor communication with the fuel tank;
a diaphragm movable with respect to the housing between a first configuration and a second configuration, the first configuration substantially preventing fuel vapor flow between the first and second ports, and the second configuration permitting fuel vapor flow between the first and second ports;
and
an actuator acting on the diaphragm, the actuator being in fluid communication with the refueling tube.

9. The system according to claim 8, wherein the housing defines a chamber and an aperture, a fuel vapor flow path in the chamber between the first and second ports passes through the aperture.

10. The system according to claim 9, wherein the diaphragm in the first configuration occludes the aperture.

11. The system according to claim 9, wherein the diaphragm in the first configuration divides the chamber into first, second and third sub-chambers, and the diaphragm in the second configuration divides the chamber into the first sub-chamber and a combination of the second and third sub-chambers.

12. The system according to claim 11, wherein the actuator includes the first sub-chamber.

13. The system according to claim 8, wherein the isolation valve comprises a resilient element biasing the diaphragm toward the first configuration, the resilient element includes a first end engaging the housing and a second end engaging the diaphragm.

14. The system according to claim 13, wherein the resilient element comprises a compression spring.

15. The system according to claim 13, wherein the diaphragm comprises:
a central portion engaging the second end of the resilient element;
a peripheral portion being fixed with respect to the housing; and
an intermediate portion extending between the central and peripheral portions, the intermediate portion including a flexible material relative to the central portion.

16. The system according to claim 15, wherein the central portion of the diaphragm comprises a rigid plate, and the intermediate portion comprises a convolute.

17. A method of controlling fuel vapor flow between a fuel vapor headspace of a fuel tank and a fuel vapor collection canister, the method comprising:

 permitting with a fuel tank isolation valve the fuel vapor flow from the fuel vapor headspace of the fuel tank to fill the fuel vapor collection canister;

 preventing with the fuel tank isolation valve the fuel vapor flow from the fuel vapor headspace of the fuel tank during purging of the fuel vapor collection canister; and

 supplying vacuum to actuate the fuel tank isolation valve during refueling of the fuel tank.

18. The method according to claim 17, wherein the refueling comprises adding fuel to the fuel tank via a refueling tube, and the adding fuel drawing the vacuum in the refueling tube.

19. The method according to claim 18, wherein the supplying the vacuum comprises establishing a fluid coupling between the refueling tube and the fuel tank isolation valve so as to communicate the vacuum drawn in the refueling tube to the fuel tank isolation valve.

20. The method according to claim 17, wherein the supplying vacuum during refueling assists in the permitting the fuel vapor flow from the fuel vapor headspace of the fuel tank to the fuel vapor collection canister.